



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,340	02/25/2004	Hiroyuki Akatsu	FIS920030411US1	2339

32074 7590 09/22/2005

INTERNATIONAL BUSINESS MACHINES CORPORATION
DEPT. 18G
BLDG. 300-482
2070 ROUTE 52
HOPEWELL JUNCTION, NY 12533

EXAMINER

NGUYEN, DAO H

ART UNIT PAPER NUMBER

2818

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/708,340

Applicant(s)

AKATSU ET AL.

Examiner

Dao H. Nguyen

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0204.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the communications dated 02/25/2004 through 09/01/2005.

Claims 1-20 are active in this application.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.
 - a. Information Disclosure Statement (IDS) filed on 02/25/2004. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

- b. Applicant made a provisional election without traverse to prosecute the invention of Group I, claims 1-10, drawn to a semiconductor device. Affirmation of this election was made in the Response to Restriction Requirement filed 09/01/2005.

Claims 11-20 had been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

Drawings

3. The drawings are objected to for the following reasons.

Figures 1-2 are not designated by a legend such as "Prior Art". The Legend is necessary in order to clarify what applicant's invention is (see MPEP § 608.02g).

Correction is required.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2818

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim(s) 1 is/are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,798,561 to Sato.

Regarding claim 1, Sato discloses a bipolar transistor (HBT), as shown in figs. 1, 3, comprising:

a collector including a frustum-shaped collector pedestal 1003 (fig. 1) having an upper surface, a lower surface, and a slanted sidewall (adjacent isolation region 1004) extending between said upper surface and said lower surface, wherein said upper surface has substantially less area than said lower surface;

an intrinsic base 1019 overlying said upper surface of said collector pedestal 1003;

an emitter 1016 overlying said intrinsic base 1019; and

a raised extrinsic base 1007 conductively connected to said intrinsic base 1019.

7. Claim(s) 1-10 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 5,320,972 to Wylie.

Regarding claim 1, Wylie discloses a bipolar transistor (HBT), as shown in figs. 6-8, comprising:

a collector including a frustum-shaped collector pedestal 54 having an upper surface (contacting an intrinsic base 52), a lower surface (contacting the substrate 32), and a slanted sidewall extending between said upper surface and said lower surface, wherein said upper surface has substantially less area than said lower surface;

an intrinsic base 52 overlying said upper surface of said collector pedestal 54;

an emitter 60 overlying said intrinsic base 52; and

a raised extrinsic base 68&74 conductively connected to said intrinsic base 52.

Regarding claim 2, Wylie discloses the bipolar transistor further comprising a region 36 including at least one material selected from dielectrics, lightly-doped semiconductors, and intrinsic semiconductors contacting said slanted sidewall of said collector pedestal. See figs. 6-8 and col. 5, lines 43-66.

Regarding claims 3-4, Wylie discloses the bipolar transistor comprising all claimed limitations.

Note that the limitation(s) "said collector pedestal is formed by ..." is/are process limitation(s), and the discussed claim is drawing to a product. The process limitation(s) of how the collector pedestal being formed has/have no patentable weight in claim drawn to structure. Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ

Art Unit: 2818

554 does not deal with this issue) and In re Marosi et al, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. MPEP §2113 states that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)."

Therefore, the recitation "said collector pedestal is formed by ..." in claims 3-4 is/are considered process(es) of making product(s) and has/have been given no patentable weight in product-by-process claims and is/are thus non-limiting.

Regarding claim 5, Wylie discloses the bipolar transistor wherein said region 36 includes a layer of silicon nitride extending between a shallow trench isolation 40 and said slanted sidewall of said collector pedestal. See figs. 6-8.

Regarding claim 6, Wylie discloses the bipolar transistor further comprising a dielectric spacer 66, wherein said raised extrinsic base 74 is self-aligned to said emitter 60 and spaced from said emitter by said dielectric spacer 66. See figs. 6-8.

Regarding claim 7, Wylie discloses the bipolar transistor wherein said emitter 60 is self-aligned to said collector pedestal 54. See figs. 6-8.

Regarding claim 8, Wylie discloses the bipolar transistor wherein a centerline of said emitter 60 is aligned to a centerline of said collector pedestal 54. See figs. 6-8.

Regarding claim 9, Wylie discloses the bipolar transistor wherein said emitter 60 and said collector pedestal 54 are formed in a photolithographically patterned opening in a layered stack of materials. See figs. 6-8.

Regarding claim 10, Wylie disclose the bipolar transistor wherein said intrinsic base 52 includes a layer of a single-crystal semiconductor which forms a heterojunction with at least one of said emitter and said collector pedestal. See figs. 6-8, and col. 6, line 44 to col. 7, line 7.

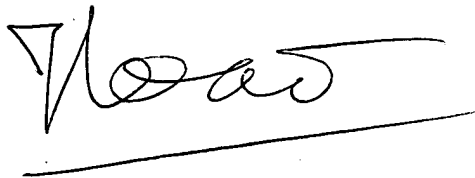
Conclusion

Art Unit: 2818


8. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.



Dao H. Nguyen
Art Unit 2818
September 17, 2005.



David Nelms
Supervisor
Patent Examiner
for 2800